

WHAT IS CLAIMED IS:

1. A communication device for communicating with a plurality of communication terminals, comprising:

correlation calculation means for calculating the correlation between a received signal corresponding to signals transmitted from a plurality of communication terminals by means of UWB (Ultra WideBand) communication and pulses at possible positions in a signal transmitted from each communication terminal; and

demodulation means for demodulating data transmitted from the respective communication terminals on the basis of the correlation, taking into account interference among the signals transmitted from the communication terminals.

2. A communication device according to Claim 1, wherein the signals transmitted from the communication terminals are generated by modulating data by means of M-ary pulse position modulation.

3. A communication device according to Claim 1, wherein the signals transmitted from the communication terminals are generated by modulating data by means of M-ary orthogonal modulation.

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4. A communication device according to Claim 1, wherein the demodulation means demodulates data by detecting an optimum symbol or an optimum symbol sequence on the basis of the correlation, taking into account interference among the signals transmitted from the plurality of communication terminals.

5. A communication device according to Claim 4, wherein the demodulation means detects an optimum symbol or an optimum symbol sequence by means of maximum-likelihood estimation on the basis of the correlation, a correlation matrix indicating the correlation among pulses at possible positions in the transmitted signals, the energy of the transmitted signals, and the possible pulse positions.

6. A communication device according to Claim 1, wherein the demodulation means demodulates data by detecting a suboptimum symbol or a suboptimum symbol sequence on the basis of the correlation, taking into account interference among the signals transmitted from the plurality of communication terminals.

7. A communication device according to Claim 6, wherein the demodulation means comprises:

conversion means for making a conversion of the

correlation using the inverse matrix of the correlation matrix indicating the correlation among pulses at possible positions in the transmitted signals; and

detection means for detecting a suboptimum symbol or a suboptimum symbol sequence on the basis of the output of the conversion means.

8. A communication device according to Claim 6, wherein the demodulation means converts the correlation such that the mean square error becomes minimum and detects the suboptimum symbol or the suboptimum symbol sequence on the basis of the converted correlation.

9. A method of communication with a plurality of communication terminals, comprising the steps of:

calculating the correlation between a received signal corresponding to signals transmitted from a plurality of communication terminals by means of UWB (Ultra WideBand) communication and pulses at possible positions in a signal transmitted from each communication terminal; and

demodulating data transmitted from the respective communication terminals on the basis of the correlation, taking into account interference among the signals transmitted from the communication terminals.

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10. A program used by a computer to perform communication with a plurality of communication terminals, the program comprising the steps of:

calculating the correlation between a received signal corresponding to signals transmitted from a plurality of communication terminals by means of UWB (Ultra WideBand) communication and pulses at possible positions in a signal transmitted from each communication terminal; and

demodulating data transmitted from the respective communication terminals on the basis of the correlation, taking into account interference among the signals transmitted from the communication terminals.

11. A storage medium storing a program used by a computer to perform communication with a plurality of communication terminals, the program comprising the steps of:

calculating the correlation between a received signal corresponding to signals transmitted from a plurality of communication terminals by means of UWB (Ultra WideBand) communication and pulses at possible positions in a signal transmitted from each communication terminal; and

demodulating data transmitted from the respective communication terminals on the basis of the correlation, taking into account interference among the signals

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